absorb moisture. When it is planted a root must have the earth trodden firmly down upon it, or it may as well never have been planted. It is like a man dying of want with plenty just beyond his reach. The minute haustoria, or organs of absorption, require to be in most intimate connection with the earth before they can take any nourishment from it; firm packing is therefore an absolute necessity.

It does not seem that the soil has ever been studied with regard to its capacity for tree growing. This is a most important point and, as every forester knows, is the first of the local factors to be considered when a new plantation is projected.

The soil here consists principally of a clayey, sandy loam, or perhaps a sandy, loamy clay would describe it better. When turned up by the plough it is dry, and if you dig deeper it is still dry. Dig ten or twenty feet and you may find the same grey, dry soil. It is hard also; the soft, spongy feel of the soil of moister countries is wanting. The heavy winds passing over it for centuries have dried it and pressed it, so that now scarcely any moisture is to be found in it at all. The prairie grasses use up all there is, and their closely matted roots shed the rain off the surface, making the supply scantier still. Plough up that soil and let air and moisture in, and you can raise fine crops of grain. The whole secret of its fertility seems to lie in the air and the moisture. Given these, it seems as if the whole character of the soil is changed. From a hard, dry, grey soil, able to support only a covering of prairie grasses, it becomes a rich, blackish or brown, porous soil, able to produce almost any kind of hardy crop. This on the surface. Underneath the ploughed belt you find the same grey, dry, closely-pressed soil. To plant a tree in soil of this description without adequate preparation beforehand would be simply to court disaster.

Tree planters here seem to expect impossibilities. They will calmly dig a hole in the ground a little larger than the roots of the proposed tree; perhaps throw in a few chunks of manure; plant the tree carefully or not, according to the degree of intelligence of the operator, and expect it to grow. Now, what happens? Unless a particularly copious supply of water is forthcoming, such as that from an irrigation ditch, that tree is going to die, or if it lives, it only languishes and does not flourish; and all for the lack of moisture. To be sure, it may be watered, and well watered, at least as far as quantity poured out goes, but usually most of the water thus applied runs off on the surface and is of no use. What does get into the soil is soon absorbed, not by the roots, but much of it by the dry, thirsty walls of the pit they are in. These walls have been thirsting for water for centuries and greedily drink it up whenever they get the opportunity. And even though the watering be done every day there is never enough and, as we have said, the tree may live but cannot flourish. If grain were given like treatment there would be no better result. But a grain field has a porous surface all over it, and not only a porous surface but a porous interior as well, or at least an interior which readily conducts water by capillary attraction, so that the necessary moisture can move in any direction the demands of the rootlets require. The soil moisture is also protected from the evaporative influence of the sun and wind, primarily by the shade and shelter which the young plants afford.

If we planted a tree under similar circumstances we might safely expect similar results. To do so we would require a soil that would readily admit moisture and preserve it after it was admitted. It would need to be a soil that was retentive as well as porous, and as our natural soil is absorbent rather than retentive, and unlikely to yield up its moisture when called upon, we would require our trees to be planted far enough away from the natural soil that its absorbent influence would have as little effect as possible on the quantity of water available for growth.

Now in the case of single trees, if a good wide hole four or five times the diameter of the root intended to occupy it and never less than six feet, were dug to a depth of two or three feet, and the soil well loosened and mixed with two year old, well rotted manure, there would be a fair chance for a tree planted in it to grow. The manure would need to be plentiful for the great need of the soil is vegetable matter to retain the water which enters it, and give it up readily when required by the growing tree. The whole well watered as it was put in would be of great advantage. A depth of three inches from the surface left unfilled, with the tree of course planted properly below that depth, would leave ample room for a good layer of hay, straw or manure. Water thrown over this would not run off nor would it puddle the surface and cause it to cake when dry and shut off the air circulation. The water would be retained in the mulch and allowed to soak into the soil in an even and satisfactory manner. Less water would be required, or at least less frequent waterings, for all or most of the water supplied would be useful to the plant.

And so also with shelter belts, only instead of a number of isolated holes have a continual belt of trenched ground manured and treated in the same way.

Only those who have tried planting in dry districts can know the value of well trenched and mulched ground. It often is simply the difference between success and the want of it. Moisture enters easily and is retained or preserved from evaporation in the mulch. Every portion of the trenched ground is moistened, for capillarity will enable the water to distribute itself evenly through the earth and also, as fast as it is taken up by the feeding roots, the same law, by a reverse action, will enable the supply at the growing point to be kept up. Thus the tree is practically enabled to make use of all the moisture in the trenched ground whether it was originally deposited near it or not.

And when you come to consider it, this moisture-holding layer on the surface is really the natural condition under which the forest tree thrives in its native habitation. The layer of humus of the surface of the forest ground is the great storehouse of moisture, not only for the supply of the trees but also for the sprigs which are fed from the surplus.

The kind of tree to plant is also a much debated question. Some try Manitoba maples and others try various poplars and willows, but nowhere do you hear of much success with either. The time to plant, too, appears to be a matter of uncertainty. You hear a few points in favor of fall planting, but there is little or no reliable experience to go upon, and the new comer has just to begin from the same point as the man who began several years ago.

The problem is a many-sided one, and only a series of careful experiments conducted here, right in the region of the Chinooks, will ever furnish us with a satisfactory solution.

It has been said that the Manitoba maple will not stand the repeated frosts and thaws of our winter, and yet there is at least one specimen the writer has seen, about fifteen or twenty feet high, which is strong and vigorous and bears fruit frequently. That the Chinooks have not had the usual destructive effect on this specimen is apparent. Possibly the planting and after treatment might account for it, or perhaps the seasons for a few years after planting might have been different